

Applicant : Helmut Gross et al.
For : DEVICE FOR DIE CUTTING A STACK CONSISTING OF SHEET-TYPE MATERIALS
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

The paragraph beginning on page 2, line 7 has been amended as follows:

--The device design cited ensures that the die-cutter blade, as held in the frame and placed into the device, can be [calculated] oriented in defined fashion relative to the punching ram directed toward the stack, particularly in a plane perpendicular to the relative direction of motion of the punching ram and the die-cutter blade, in each case with respect to both translational and rotational aspects.--

The paragraph beginning on page 3, line 32 has been amended as follows:

--The frame portion and the primary clamping beam are thus charged with accommodating the clamping elements for fixation of the die-cutter blade. These clamping elements, which are, in particular, formed as clamping shoes, fix the [clamping] die-cutter blade on sides of the die-cutter blade facing away from one another, such that the clamping elements of the primary clamping beam, under the influence of the clamping agents of the secondary clamping beam, press the die-cutter blade into the clamping elements of the frame. Once the clamping elements for the die-cutter blade have been brought largely into position and pre-tensioned, and the slideably frame-mounted primary clamping beam is also held relatively firmly -- however so that it can still be slid -- within the frame, the similarly slideable secondary clamping beam is positioned near the primary clamping beam and firmly tightened. By adjusting the clamping agents that contact the primary clamping beam, the die-cutter blade is firmly fixed between the clamping elements as a consequence of the primary clamping beam's slight relocation. The firm connection is then established between the primary clamping beam and the frame, wherewith the die-cutter blade is held particularly firmly to the frame.--

The paragraph beginning on page 4, line 23 has been amended as follows:

--A further design concerns itself with the particular seating of the frame upon the punch platen and the direct introduction of punching forces from the die-cutter blade to the punch platen via those frame areas associated with the die-cutter blade. The die-cutter blade is held adjustably in the frame, which is held in the receiving apparatus that is connected to the punch platen. The receiving plate exhibits the two gibs arranged in parallel, between which the frame is held. The frame exhibits a frame portion and at least one adjustable clamping beam within the frame portion for fixation of the die-cutter blade. The clamping beam rests upon the punch platen in the vicinity of the beam's ends; moreover, the [distance] leg of the frame portion which serves to receive the die-cutter blade rests upon the punch platen. The section of the frame portion facing away from this section of the frame portion is arranged at a distance from the punch platen.--

The paragraph beginning on page 6, line 6 has been amended as follows:

--Fig. 9 a section corresponding to the [lines] Figures 6 to 8, illustrating the condition of fixation of the frame in the punch platen,--

The paragraph beginning on page 9, line 16 has been amended as follows:

--Gibs 14 and 15 are designed as wedged gibs, between which the frame 16 can be slid in the sense of the double arrow "O" and from which said frame can be withdrawn. Figure 4 illustrates the relationships prior to sliding in the frame 16, for example. The side of the frame facing the gibs 14 and 15 exhibits beveled regions 38 that articulate with the projections 39 of the gibs 14 and 15. The separation distance of the two gibs 14 and 15 is set such that the frame 16 can be slid in between the gibs with little play. The frame 16 accommodates the die-cutter blade 18 which has been pre-adjusted in an as yet to be described manner. The frame 16 consists of two long, parallel, lateral legs 40 and two parallel short legs 41 which connect them, whereby the leg 41 associated with gib 15 exhibits a relatively large extension in relation to the longitudinal direction of the lateral leg 40. The underside of this short leg 41, i.e. the side facing the centering bolt 37, is provided with a t-slot 42 that runs parallel to the

longitudinal direction of the lateral leg 40. The process of sliding the frame 16 in between the gibs 14 and 15 is illustrated in Figures 6 to 9; however, as opposed to the representations in Fig. 4 and 5, not from right to left, but rather from left to right. Depicted is the wider short leg 41 of the frame 16, which is provided with two clamping shoes 44 to hold the die-cutter blade 18 on one side of the die-cutter blade. The underside of this leg 41 is provided with a t-slot 42 that extends perpendicular to the plane of the illustration sheet. The moveable centering bolt 37 is set into a recess of the punch platen 12. Said bolt can be moved in and out by means of a pneumatic cylinder 45, whereby the pneumatic cylinder 45 works upon a thrust piece 46, between which piece and the centering bolt 37 a spring 47 is located. Upon sliding the frame 16 between the gibs 14 and 15 as illustrated in Fig. 6, a leading bevel 48 of the frame leg 41 initially presses against the centering bolt 37, and presses it into the punch platen 12 against the force of the spring 47 so that the frame 16 can be further slid in between the gibs 14 and 15. This stage is illustrated in Fig. 7. As soon as the frame 16 has been slid in far enough for the centering bolt 37 to find itself in line with the t-slot 42, the spring 47 pushes the centering bolt 37 out slightly, until the spring [37] 47 reaches a stop. The centering bolt 37, which projects just slightly above the surface of the punch platen 12, has slid out along a further bevel 49 of the frame leg 41 and laterally contacts a projection 50 on the frame, thereby establishing the centered position of the frame, as illustrated in Fig. 9. As illustrated in Fig. 9, the frame 16 is fixed in position relative to the punch platen 12 in that the centering bolt 37 is extended by impingement of the pneumatic cylinder [5] 45, whereby said bolt traverses the t-slot 42 in the frame.--

The paragraph beginning on page 10, line 27 has been amended as follows:

--Figures 10 to 14 illustrate the details of the mounting of the die-cutter blade 18 in the frame 16, as well as the mounting of the frame 16 in the punch platen 12. As can be deduced in the embodiment according to Fig. 10, which corresponds to that of Figures 4 and 5, the die-cutter blade 18 is held by means of a pair of clamping shoes 44 which grip one of the opposing sides of the die-cutter blade. One of the pairs of clamping shoes 44 formed by the two clamping shoes 44 is threaded into the wide,

short leg 41 of the frame 16, whereas the pair formed by the other two clamping shoes 44 is threaded into a primary clamping beam 53 which is arranged in parallel to the legs 41 and itself threaded into the lateral legs 40 of the frame 16. This clamping beam [3] 53, exactly like a second clamping beam 54 arranged in parallel to it, is slideably mounted in the lateral leg 40 along its longitudinal direction. The primary clamping beam can therefore always be slid in tightly against the die-cutter blade 18 in relation to the magnitude of the die-cutter blade 18, which the clamping shoes 44 of the die-cutter blade 18 grasp from both sides. The screws 55 associated with the clamping shoes and the screws 56 associated with the primary clamping beam [3] 53 are then tightened slightly and the screws 67 associated with the secondary clamping beam 54 tightened more firmly, such that the secondary clamping beam 44 can no longer be slid relative to the lateral legs 40. The screws 58 which traverse the secondary clamping beam 54 in the plane of the frame are driven against the primary clamping beam 53 and exert a permanent pre-tensioning on the primary clamping beam 53, whereby permanent clamping of the die-cutter blade 18 between the clamping shoes 44 is ensured. The screws 55 and 56 are subsequently tightened.--

The paragraph beginning on page 11, line 14 has been amended as follows:

--The slots 60 that run in the longitudinal direction of the lateral legs 40 for the purpose of sliding the two clamping beams 53 and 54 are depicted with respect to the modified form according to Figures 11 and 12. The primary clamping beam 53 and the wide, short leg 41 exhibit multiple adjacently arranged threaded holes 59 so that the clamping shoes 44 can be connected with the primary clamping beam [3] 53 and/or the wide, short leg 41 at a suitable distance from one another relative to the width of the die-cutter blade 18 in use. The embodiment according to Figures 11 and 12 differentiates itself from that according to Fig. 10 however, in that the secondary clamping beam 54, which exerts pre-tensioning onto the primary clamping beam 53 via the screws 58, is mounted in an upper section of the respective lateral leg 40 that is shaped like a wedge 61, so that a secure fixation of the die-cutter blade 18 between the clamping shoes 44 is ensured even after periods of its extended use. Not only is a displacement of the secondary clamping beam 54 countered on the basis of the wedge

61; but rather the clamping shoes 44 are also threaded by means of screws 55 into the wide, short leg 41 and the primary clamping beam 53 over wedge-shaped bevels that increase in thickness toward the die-cutter blade 18. As can be deduced from the representation in Fig. 12, the screws 55 traverse slotted holes that are oriented in the longitudinal direction of the lateral leg 40 and the screws are provided with wedge-shaped washers 63.--

The paragraph beginning on page 11, line 31 has been amended as follows:

--Instead of the wedge [41] 61 for secure positioning of the secondary clamping beam 54 away from the die-cutter blade 18, a form-fitting connection may be provided between the lateral legs 40 and the secondary clamping beam 54, as illustrated in Fig. 13. This form-fitting connection is effected via serrated mesh surfaces 64 between leg 40 and clamping beam 54.--

The paragraph beginning on page 12, line 1 has been amended as follows:

--Figures 11 and 12 illustrate that the clamping shoes 44 are provided with projections 65 that form a step-like, acutely angled setback, which serves to accommodate a complementary contour 66 of the die-cutter blade 18. It is further illustrated that the two lateral legs 40 adjacent to the wide, short leg [40] 41 are provided with slots 67 that run parallel to it for accepting an insertion ruler as to be described in greater detail below.--

The paragraph beginning on page 12, line 6 has been amended as follows:

--Fig. 14 illustrates that the punching force F_S is transferred directly, and therefore along the shortest path, as a bearing pressure F_A to the wide, short leg 41 and the primary clamping beam 53, which directly support themselves against the punch platen 12. In contrast, the narrow, short leg [40] 41 does not lie directly on the punch platen 12. The slide ram 52 of the clamping cylinder 51 presses against the beveled region 38 of this leg 41 and not only causes the frame 16 to be pressed against the gib 15, but

also the frame 16 to be impinged with a force vector in the direction of the punching force F_s . It is not mandatory for the clamping cylinder 51 to be mounted in the gibs 14 and 15; the possibility also exists to mount it in the punch platen 12. In this case, however, relatively long adjustment paths for the slide ram 52 of the clamping cylinder 51 must potentially be effected, depending upon the positional location of the frame 16.--

The paragraph beginning on page 13, line 4 has been amended as follows:

--Figure 19 depicts the die-cutter blade 18 held in the frame 16 by the clamping shoes 44 in conjunction with the height adjustment of the die-cutter blade 18, and the frame 16 mounted in the punch platen 12. The main plate 10 of the machine housing 1 is provided with a storage plate 75 perpendicular to the former, that extends in the direction of the die-cutter blade 18 for storing the stack 8. A sensor 76 which projects beyond the end edge of the storage plate 75 is connected to the lower side of the storage plate 75, which sensor detects a Separation Distance A in front of the the end edge of the storage plate 75 in the sense of the depicted line 77 parallel to the main plate 10. The punch platen 12 is driven via non-depicted, motorized adjusting agents in the direction of double Arrow "P" by means of adjusting drives associated with the guide pins 11 such that the knife edge 19 coincides with the line 77. Fig. 20 illustrates an alternative embodiment, which provides no sensor 76, but rather a distance measurement system 78 to determine the distance between the main plate 10 and the punch platen 12, which system, by way of example, is initialized when the main plate 10 and the punch platen 12 are at a position of maximum separation and then moves the two parts toward a defined separation distance corresponding to the Separation Distance A between the end edge of the plate 75 and the knife edge 19.--

The paragraph beginning on page 14, line 3 has been amended as follows:

--Figures 23 to 26 illustrate details in the feed area of the stack 8 to be pressed. As a consequence of the inclined arrangement of the die-cutting device 9, said stack rests against the inclined storage plate 75 and supports itself laterally against the main plate

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10. A limiting element 88 as well as the slide-in unit 21 are moveably and adjustably mounted relative to the storage plate 75. In this context, the slide-in unit 21 can be driven against a stop 89. Both a central adjustment 90, as well as a dimensional adjustment 91 independent thereof, are provided for the limiting element 88 and the stop 89. The dimensional adjustment is achieved by means of oppositely-threaded screws 93 that are axially fixed in a supporting element 92, which screws accommodate the limiting element 88 and the stop 89, allowing them to be adjusted by means of a knurled knob [93] 94. The central adjustment of the limiting element 88 and the stop 89 are achieved via the supporting element 92, into which a screw 95 connected to an axle extension 96 is threaded, which extension is axially fixed and rotatably-mounted in an extension 97 connected to the plate 75. The screws 93 are likewise connected to an extension 98 that is axially fixed but rotatably-mounted in extension 97.--

The paragraph beginning on page 14, line 17 has been amended as follows:

--The toothed belt 27 accommodates the slide-in unit 21 via a pneumatic spring element 99, which can be moved back and forth in the sense of the depicted double arrow. The slid-in position of the slide-in unit 21 is clarified in this figure with solid lines, whereas a partially slid-in position is illustrated by lines in which solid dashes alternate with double points. The slide-in unit 21 contacts the stop [98] 89 in the slid-in position, which in turn limits the slide-in travel of the unit. The pneumatic spring element 99 serves to relieve the drive for the toothed belt 27 when it is driven against the stop 89; or for cases in which the stop 89 moves the slide-in unit 21 counter to the direction of insertion as a result of manual adjustment, particularly manual enlargement of the format via the dimensional adjustment 91.--